

LOCKING DEVICE FOR A PLANE MACHINE

BACKGROUND OF THE INVENTION

1. Field of the Invention

5 This invention relates to a locking device for a plane machine, particularly to one locking a machine base with four posts of a plane machine.

2. Description of Prior Art

A conventional plane machine generally has a machine base moving up and down along posts, and in order to reinforce stability of the machine base, some plane machines have a locking device for locking the machine base with the posts after adjusted in its height, as disclosed in a US patent of No. 5771949 shown in Figs. 10 1 and 2. It includes posts 1, a handle 2 provided between two posts 2. When the handle 2 is pressed down, a locking rod 3 and a length-changing rod 4 respectively positioned at the front and at the rear of the machine base are pressed down. The length-changing rod 4 consists of a first connect rod 5 and a second connect rod 6 inserted in a connect groove 7 of the first connect rod 5. The first connect rod 5 has a center slot 8 for receiving a spring 9, forcing the second connect rod 6 to be indirectly pushed by the spring 9. So when the handle 25 2 is pressed down, the locking rod 3 may force the second connect rod 6 move backward to compel the clamp firmly clamp the post 1.

However, the conventional plane machine has too many components to form a very complicated structure, demanding comparatively high precision, taking much time in assembling, difficult to obtain expected effect.

5 SUMMARY OF THE INVENTION

This invention has been devised to offer a locking device for a plane machine, which includes a handle to move an actuating rod to move lengthwise in line on a machine base, then moving inward two side bases
10 limitedly positioned at two sides of the machine base. Then an urging block respectively fixed at two sides of each side base clamp tightly each of four posts so that the machine base may be firmly locked with the posts, after adjusted in its height.

15 BRIEF DESCRIPTION OF DRAWINGS

This invention will be better understood by referring to the accompanying drawings, wherein:

Figure 1 is an exploded perspective view of a locking device of a conventional plane machine;

20 Figure 2 is a perspective view of the locking device of a conventional plane machine;

Figure 3 is a perspective view of a plane machine having a locking device in the present invention;

Figure 4 is a partial perspective view of the plane
25 machine with the locking device in the present invention;

Figure 5 is a partial exploded perspective view of

the locking device in the present invention;

Figure 6 is a partial enlarged perspective view of the locking device in the present invention;

Figure 7 is an upper view of the locking device in a loose condition in the present invention; and,

Figure 8 is an upper view of the locking device in a tightly locked condition in the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

10 A preferred embodiment of a locking device for a plane machine in the present invention, as shown in Figs. 3, 4 and 5 is combined with a plane machine, which includes a bottom base 20, four posts positioned respectively at four corners of the bottom base 20, a
15 machine base 30 connected with the four posts 21 by means of a ring 31, a moving rod 22 threadably connected with the center portion of two sides of the machine base 30, a rotating button 23 to control a threaded rod 22 in upright movement. Those components
20 are the same as the convention art, not to be described. The important improvement of the invention is the components described below.

A locking device to be provided on the machine base 30 includes two rod bases 40, an actuating rod 50, a
25 handle 60, and two side bases 70.

The two rod bases 40 are respectively fixed on the upper surface of two sides of the machine base 20,

having a shaft hole 41 for the actuating rod 50.

The actuating rod 50 has two ends respectively fitting in the shaft holes 41 of the two rod bases 40, an insert rod 51 fixed upright on the left end, and a spring 52 fitting around the right end.

The handle 60 is L-shaped, having a shaft hole 61 in one end for a pivotal shaft 62 to fit therein and also to extend pivotally in an upper surface of the left side of the machine base 30, a rectangular groove 63 formed in an outer end near the shaft hole 61 for the insert rod 51 to fit therein. Then the handle 60 can move the actuating rod 50 lengthwise when it is pushed inward from a normal position to a locking position.

The two side bases 70 are shaped as an elongate plate, respectively positioned on the upper surface of the two sides of the machine base 30, having a limit slot 71 respectively in two sides for a limit screw 72 to screw with and also with the machine base 30. Each side base 70 further has an urging block 73 respectively at two sides, and each urging block 73 has a vertical urging surface 731, with the distance between two of the urging surfaces 731 being a little larger than the distance between the two posts 21. Further, each side base 70 has a pair of pivotal studs 74 to pivotally connect with the two ends of the actuating rod 50, and at the same time the two ends of the spring 52 held at the right end of the actuating rod 50 between the outer edge of the rod base

40 and the pivotal stud 74. Then the rod base 40 is a bit
biased to the right side of the machine base 30 by the
elasticity of the spring 52 when the locking device in the
normal condition, with the handle 60 being in not
5 pressed inward. That is, the machine base is not locked
with the posts 21. But when the machine base is wanted
to be locked with the posts 21 after adjusted in its height,
the handle 60 is pushed inward, moving the actuating rod
to force the two side bases 70 move nearer to the center
10 of the machine base 30 resisting the elasticity of the
spring 52, and subsequently the urging surface of the
four urging blocks 73 compress respectively the inner
wall of the four posts 21, in case the handle 60 is pressed
inward to a locking position. Thus the machine base 50 is
15 locked with the four posts 21.

Next, the two urging blocks 73 positioned on each
side base 70 may be made with one being stationary and
the other being rotatable pivotally. The stationary
urging block is then locked with the outer wall of a plate
20 75 extending up from one side of each side base 70 by
means of a screw 76. And the rotatable urging block is
pivotally connected with the other side of each side base
70 by means of a pivot 77. Further, a stud 78 is provided
upward at the other side of the side base 70, and a screw
25 79 with a buffer spring 791 is fitted around pivotally
connected with the stud 78 so the buffer spring 791
compresses the urging block 73 to move farther away

from one end of the pivotal point. Then the urging block 73 may extend downward to rest on a stop 732 at the side edge of the side base 70. Thus when the urging block 73 is compressed by the buffer spring 791, the urging block 5 73 is prevented from rotating outward by the stop 732. When the urging block 73 presses tightly each post 21, the buffer spring 791 may buffer the pressure. Further, in order to facilitate the urging block 73 to press smoothly each posts 21, the urging block 73 has its front 10 portion of the outer wall shaped with a proper slope to contact each post 21 so as to let each post 21 gradually contact with the urging surface 731 of the urging block 73.

Next, as shown in Figs. 7 and 8, the function of the 15 locking device is to be described. When the machine base 30 is not yet locked in the normal position, the handle 60 of the locking device is in a loose not-locking position, with the right one of the two side bases 70 actuated by the actuating rod 50 urged by the elasticity of the spring 20 52 to bias to the machine base 30. And the two urging blocks 73 of the right side base 70 are positioned at an outer side of two posts 21, and the two urging blocks 73 on the left side base 70 are positioned at an inner side of the other two posts 21, in the separated condition 25 without contacting with one another.

If the machine base 30 is wanted to be locked after adjusted in its position, the handle 60 is pushed inward

to a locking position, letting the insert rod 51 move the
actuating rod 50 and then the two side bases 70 nearer to
the center of the machine base 30, with the two pairs of
the urging blocks 73 respectively pressing from the
5 outside and from the inside to the posts 21 so as to lock
the machine base 30 with the four posts 21.

On the contrary, if the machine base 30 is wanted
to be released from the posts 21, repeating reversely the
locking process can attain the purpose, with the spring
10 52 combined at the right end of the actuating rod 50
recovers its elasticity to push back the side bases 78 to
its biased position. So the locking device is easy to
operate.

While the preferred embodiment of the invention
15 has been described above, it will be recognized and
understood that various modifications may be made
therein and the appended claims are intended to cover all
such modifications that may fall within the spirit and
scope of the invention.